



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,881	11/19/2003	Steven Gianoulakis	A8431/T51500	9363
57385	7590	12/12/2005		
TOWNSEND AND TOWNSEND AND CREW LLP / AMAT TWO EMBARCADERO CENTER EIGHTH FLOOR SAN FRANCISCO, CA 94111-3834			EXAMINER LUND, JEFFRIE ROBERT	
			ART UNIT	PAPER NUMBER
			1763	
DATE MAILED: 12/12/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/717,881

Applicant(s)

GIANOULAKIS ET AL.

Examiner

Jeffrie R. Lund

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/03, 8/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. Figures 1A, 1B, and 1C should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 is indefinite in that it is not clear what the claim is claiming, at a minimum, the phrase "the plurality of second channels" lacks antecedent basis, and the exact structural relationship between the plurality of second channels and the second exhaust conduit is not clearly claimed and in conflict with the structure claimed in claim 1. The structural relationship claimed in claim 10 requires that the plurality of second channels are in fluid communication with the fore line via a valve, and the second

Art Unit: 1763

exhaust conduit is also in fluid communication with the fore line via a second valve.

This differs from claim 1, in which, the second conduit is in fluid communication with the second exhaust conduit. Claim 10 as currently written is not searchable.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 9 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Williams, US Patent 5,614,026.

Williams teaches a processing apparatus that includes: walls enclosing a process chamber 333; a susceptor 326 for supporting a wafer 108; a first exhaust conduit 318 in fluid communication with the chamber; a processing gas source 300 in fluid communication with the chamber through a showerhead 370, which includes a first channel in fluid communication with the processing gas source and with apertures 360 distributed over the lower surface of the showerhead, and a second channel separate from the first channel and in fluid communication with a second exhaust conduit 364 and with exhaust apertures distributed over the lower surface of the showerhead; and the first exhaust conduit and the second exhaust conduit share a common exhaust line and pump. The apertures define a first area and the exhaust apertures define a second area and the ratio of the first area to the second area is substantially constant as a function of radial distance from the center of the gas distribution showerhead. (Entire

Art Unit: 1763

document, specifically, figures 3a-3d)

6. Claims 1-3, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Adomaitis et al, WO 02/08487.

Adomaitis et al teaches a processing apparatus that includes: walls enclosing a process chamber 10; a susceptor 18 for supporting a wafer 16; a first exhaust conduit connected to gate valve 20 in fluid communication with the chamber; a processing gas source 21 in fluid communication with the chamber through a showerhead 12, which includes a first channel 26 in fluid communication with the processing gas source and with apertures 30 distributed over the lower surface of the showerhead, and a second channel 34 separate from the first channel and in fluid communication with a second exhaust conduit 35 and with exhaust apertures 32 distributed over the lower surface of the showerhead; the first exhaust conduit is connected to a first pump; and the second exhaust conduit is connected to a second pump (figure 11). The apertures define a first area and the exhaust apertures define a second area and the ratio of the first area to the second area is substantially constant as a function of radial distance from the center of the gas distribution showerhead. (Entire document, specifically, figures 3a-3c, 4-7, and 11)

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams, US Patent 5,614,026.

Williams was discussed above.

Williams differs from the present in that Williams does not teach that the ratio of the first area to the second area varies as a function of the radial distance from the center of the gas distribution showerhead.

Optimizing the size of the apertures of a showerhead is required in order to optimize the flow in the process chamber, and for each process in which the showerhead is used. It would be obvious to one of ordinary skill to vary the ratio of the first area to the second area as a function of the radial distance from the center of the gas distribution showerhead in order to optimize the flow of the process gas into and out of the chamber. Furthermore, it was held in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), by the Federal Circuit that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. (Also see MPEP 2144.04 (d))

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the ratio of the first area to the second area as a function of the radial distance from the center of the gas distribution showerhead in order to optimize the flow through the processing chamber of Williams.

Art Unit: 1763

9. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adomaitis et al, WO 02/08487.

Adomaitis et al was discussed above.

Adomaitis et al differs from the present in that Adomaitis et al does not teach that the ratio of the first area to the second area varies as a function of the radial distance from the center of the gas distribution showerhead.

Optimizing the size of the apertures of a showerhead is required in order to optimize the flow in the process chamber, and for each process in which the showerhead is used. It would be obvious to one of ordinary skill to vary the ratio of the first area to the second area as a function of the radial distance from the center of the gas distribution showerhead in order to optimize the flow of the process gas into and out of the chamber. Furthermore, it was held in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), by the Federal Circuit that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. (Also see MPEP 2144.04 (d))

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the ratio of the first area to the second area as a function of the radial distance from the center of the gas distribution showerhead in order to optimize the flow through the processing chamber of Adomaitis et al.

Art Unit: 1763

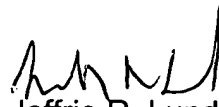
Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art teaches the technological background of the invention.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jeffrie R. Lund
Primary Examiner
Art Unit 1763

JRL
12/7/05